ECE
II-I
Electronic Devices and Circuits

1. Explain the basic concepts of semiconductor physics and junction diode characteristics.
2. Outline the basics of special semiconductor devices, and construction, working principle of rectifiers with and without filters with relevant expressions and necessary comparisons
3. Explain the construction, principle of operation of transistors, BJT and FET with their V-I characteristics in different configurations.
4. Explain the need for transistor biasing, the various biasing techniques for BJT and FET and apply the stabilization concepts with necessary expressions to bias a transistor at its Q-point.
5. Analyze small signal low frequency transistor amplifier circuits using BJT and FET in different configurations

Switching Theory and Logic Design
1. Classify different number systems and apply them to generate various number codes.
2. Utilize the concept of Boolean algebra in minimization of switching functions.
3. Design different types of combinational logic circuits.
4. Apply knowledge of flip-flops in designing of Registers and counters.
5. Design clocked sequential circuit to detect the given sequence

Signals and Systems
1. Classify complex signals and systems into various characteristic types, and formulate them using knowledge of mathematics and engineering fundamentals
2. Analyze complex signals by using Fourier concepts
3. Analyse a LTI system by using its frequency response and characterise it as LPF, HPF, BPF
4. Explain the sampling procedure, the representation of discrete-time signals (graphical& mathematical) and the reconstruction from samples.
5. Apply Laplace and Z-transforms to analyze signals and systems (continuous & discrete)

Random Variables and Stochastic Processes
1. Explain the data generation process in a random experiment; define types of random variables by their statistical characterization.
2. Develop expression for the probability density function (pdf) of a function of random variable and sum of two random variables.
3. Illustrate jointly distributed random variables by using realistic example, state their properties and theorems that define them.
4. Solve problems on the classification of random processes as statistically independent, stationary, and wide-sense stationary by using their temporal/spectral characteristics.
5. Outline the properties of the autocorrelation function and the power density spectrum.

Mathematics-III

OOPS through Java Lab
- Identify classes, objects, members of a class and the relationship among them needed for a specific problem
- Develop programs using Exception Handling mechanism
- Develop multithreaded application using synchronization concept

Electronic Devices and Circuits -Lab
1. Design, run experiments, and analyze recorded data to draw appropriate conclusions.
2. ==Plan== the input-output characteristics of passive components such as P-N junction diode, Zener diode, SCR, and UJT. ==(please verify this)==
3. Analyze circuits for AC-DC rectification.

Switching Theory and Logic Design–Lab
1. Analyze the truth tables of simple logic gates by experiment.
2. Analyze combinatorial circuits by verifying their truth tables (for MUX, DEMUX and Full adder).
3. Analyze registers and counters (ring counter, Johnson counter, synchronous and asynchronous ripple counter, Universal shift register)

Python Programming

- Make use of various pre-defined functions to write programs and test whether given strings are anagrams are not
- Develop various programs using comprehensions, generators in python
- Apply handle exceptions to write a program to sort words in a file and put them in another file.

Electronic Circuit Analysis

- Determine high- frequency parameters in terms of low-frequency parameters and analyze common Source and common drain Amplifier circuits
- Classify amplifiers and analyze cascaded transistor amplifiers
- Interpret different types of feedback amplifiers
- Categorize the types of oscillators and analyze LC oscillators
- Categorize different Power amplifiers and different types of tuned amplifiers and analyze their circuits

Digital IC Design

- Distinguish VHDL and Verilog HDL
- Design and model the combinational logic circuits with relevant digital ICs using HDL

Analog Communications
- Distinguish amplitude modulation from demodulation techniques and compare square law and Envelope detector.
- Distinguish time and frequency domains for generation of AM SSB Modulated Waves and compare different AM techniques.
- Analyze angle modulation techniques along with various methods of FM wave generation.
- Analyze various functional blocks of radio transmitters and receivers
- Analyze noise characteristics of various modulation methods and apply the principles of sampling in deriving various Pulse modulation schemes

Linear control Systems
- Classify open Loop and closed loop control systems and illustrate the mathematical models
- Outline the characteristics of the given system in terms of the transfer function and introducing various approaches to reduce the overall system for necessary analysis
- Analyze the system in terms of qualitative stability and conditional stability
- Compare time and frequency response and distinguish different plots
- Solve time invariant state equations and state transition matrix

Management and Organizational Behavior
- Outline the process of management, principles, leadership styles and basic concepts on organization.
- Distinguish Human Resource Management (HRM) and Marketing Management
- Outline the mission, goals, objectives, policy, strategy, programs and elements of corporate planning process pertaining to strategic management
- Develop positive attitude through personality development and can equip with motivational theories.
- Develop the skills pertaining to group performance and grievance handling in managing the organizational culture

Electronic Circuit Analysis Lab

1. Analyze the various oscillator, feedback amplifier, power amplifier circuits and carry out the simulation using simulation software tool
2. Compare the results obtained from software with that of hardware equipment
3. Analyze the results and provide valid conclusions

Analog Communications Lab

- Plan experimentation of various modulation, demodulation techniques and execute the simulation using the MATLAB communications toolbox
- Compare the results obtained from software with that of hardware kits.
- Analyze the results and provide valid conclusions

Digital IC Design Lab
- Design and draw the internal logical structure of the Digital Integrated Circuits
- Develop VHDL/Verilog HDL Source code and perform simulation
- Analyze the obtained simulation results using necessary synthesizer

Soft Skills
- Develop the skills to use language fluently, accurately, appropriately in debates and group discussions
- Apply the skills to write resumes and project reports
- Develop skills to face the interviews through tele and video-conferencing and skills to positive thinking